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Docket No. AMP458US

E0796

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ramkumar Subramanian et al.

Serial No.: 09/634,302

Filing Date: August 8, 2000

Title: SYSTEM AND METHOD FOR DEFECT IDENTIFICATION AND
LOCATION USING AN OPTICAL INDICIA DEVICE

Examiner: Richard A. Rosenberger

Art Unit: 2877

APPEAL BRIEF

**Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

Dear Sir:

Applicants submit this brief in connection with the appeal of the above-identified case.

I. Real Party in Interest (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest in the present appeal is Advanced Micro Devices, Inc., the assignee of the present application.

II. Related Appeals and Interferences (37 C.F.R. § 41.37(c)(1)(ii))

Appellant, appellant's legal representatives, and/or the assignee of the present application are unaware of any appeals or interferences which will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims (37 C.F.R. § 41.37(c)(1)(iii))

Claims 8-11, 13, 17-22 and 24-25 are pending in the application, and claims 1-7, 12, 14-16 and 23 have been canceled. Claims 8-11, 17-22 and 24 are allowed, and the rejection of claims 13 and 25 is appealed.

IV. Status of Amendments (37 C.F.R. § 41.37(c)(1)(iv))

No claim amendments have been entered subsequent to the final rejection.

V. Summary of Claimed Subject Matter (37 C.F.R. § 41.37(c)(1)(v))

As set forth in claim 13, an optical defect inspection system is illustrated in Fig. 1 generally at reference numeral 2, and is operable to identify and locate defects in a workpiece 8. (See, e.g., applicants' specification, page 8, lines 25-27).

The system comprises an optical measurement device 4 that is configured to view the workpiece 8 along an optical path 30. (See, e.g., page 8, lines 25-27, and page 9, lines 6-7). In addition, an optical indicia device 40 is located in the optical path 30 and operates to provide location information with respect to a defect in the workpiece 8. (See, e.g., page 9, line 11, and lines 26-28).

More particularly, and referring generally to Fig. 2A, the optical indicia device 40 comprises a generally planar transparent member 60 having non-transparent optical indicia 64 associated therewith that define a plurality of transparent regions or fields. (See, e.g., page 9, lines 19-21). Referring generally to Figs. 1 and 3, the optical indicia device 40 is mounted in a first plane that is generally perpendicular to the optical path (see, e.g., Fig. 1, and page 9, lines 11-17), and is moveable between a first position with the optical indicia device 40 located in the optical path 30, and a second position outside the optical path. (See, e.g., page 10, line 25 – page 11, line 2).

As set forth in claim 25 and illustrated in Fig. 1, an optical defect inspection system 2 is operable to locate defects in a workpiece 8. The system 2 comprises a viewing means for viewing at least a portion of the workpiece 8 along an optical path 30. (See, e.g., page 8, lines 25-27, and page 9, lines 6-7). Such a viewing means includes an optical measurement device 4 such as an optical microscope mounted on a stage 6, having an objective 12 with a lens 14 mounted to a support arm 16 by a vertical member 18. (See, e.g., page 8, line 25 – page 9, line 3). The microscope may be fixed or may move with respect to the stage. (See, e.g., page 9, lines 4-10).

The optical defect inspection system 2 further comprises a defect location means that is operable to locate a defect in the workpiece 8. The defect location means may

comprise an optical indicia device 40 mounted to the stage 6 via a base 42, with the device 40 supported by a horizontal attachment arm 48 extending outwardly from a vertical arm 44. (See, e.g., page 9, lines 11-14). The defect locating means may comprise a transparent member 60 that includes non-transparent optical indicia 64 that define a plurality of transparent regions or fields. (See, e.g., Fig. 2A, and page 9, lines 19-21). The optical indicia 64 may be arranged in a pattern, whereby the transparent regions defined thereby have one or more shapes associated therewith. (See, e.g., page 9, lines 24-26, Figs. 2A-2E, and page 10, lines 3-21).

The defect location means is selectively moveable between a first position, wherein the defect location means is within the optical path, and a second position outside the optical path. For example, the defect location means comprises the transparent member 60 coupled to a sleeve 46 that is mounted to a vertical arm 44. The sleeve 46 pivotably moves through an angle about the axis of the arm 44, thereby facilitating movement of the transparent member 60 into and out of the optical path 30. (See, e.g., page 10, lines 22-27). A position controller 90 may be included to control the rotational position of the optical indicia device 40. (See, e.g., page 12, lines 3-5). The position controller 90 operates in conjunction with a processor 94 and a memory for storing information relating to defects in the workpiece 8. (See, e.g., page 12, lines 5-13).

VI. Grounds of Rejection to be Reviewed on Appeal (37 C.F.R. § 41.37(c)(1)(vi))

Claims 13 and 25 stand rejection under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,644,399 (Hoshiyama).

VII. Argument (37 C.F.R. § 41.37(c)(1)(vii))

Claims 13 and 25 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,644,399 (Hoshiyama). Reversal of the rejection is respectfully requested for at least the following reasons.

Hoshiyama does not teach an optical indicia device or defect location means movable between a first position wherein the optical indicia device is located in the optical path, and a second position wherein the optical indicia device is located outside the optical path, as recited in claims 13 and 25, and no motivation exists to modify Hoshiyama in accordance with the claimed invention.

As admitted in the Office Action of February 11, 2005 and in the Advisory Action of April 27, 2005, Hoshiyama does not teach an optical indicia device or a defect location means that is movable between first and second positions that correspond to being in the optical path and outside the optical path, respectively, as claimed. However, the Office Action asserts that the differences between Hoshiyama and the present invention are obvious (stating: “[p]roviding means to adjust and/or remove the scale plate would have been obvious.”). (O.A., 2/11/05, p. 2, section 2, ¶13). Applicants respectfully disagree.

In order to arrive at the present invention, one of ordinary skill in the art must have been motivated to modify Hoshiyama in accordance with the present invention. It is conceded that such motivation may be found in the references themselves, in the nature of the problem to be solved, or in the knowledge generally available to one skilled in the art. MPEP § 2143.01, citing to In re Kotzab, 217 F.3d 1365, 55 USPQ2d 1313 (Fed. Cir. 2000). ***Nevertheless, such motivation and the source thereof may not be conclusory, but rather the showing must be clear and particular.*** In re Dembiczak, 175 F.3d 994; 50 USPQ2D 1614 (Fed. Cir. 1999). It is respectfully submitted that upon a proper analysis of the cited art, and application of the appropriate standard enunciated above, pending claims 13 and 25 are non-obvious over the cited art.

Hoshiyama teach a measuring apparatus in Fig. 4, wherein an image sensor unit 3 selectively receives light from one of an article 2 on a table 1, and a scale plate 4A. ***Both the scale plate 4A and the article 2 of Hoshiyama are positionally fixed in differing optical axes***, wherein the image sensor unit 3 is able to receive light

therefrom in a selective manner *via* a shutter 8A, 8B and half mirror 6 arrangement. That is, in one instance, the shutter 8A is open and the other shutter 8B closed. In such an arrangement, light from the scale plate 4A is blocked and does not reach the half mirror 6, instead light is received by the image sensor 3 solely from the article 2 through the open shutter 8A. In the second instance, light is received solely from the scale plate 4A *via* an open shutter 8B, while light from the article 2 is blocked by the other shutter 8A being closed. Therefore, as set forth by Hoshiyama, "a predetermined portion of the article 2 and the relevant marks on the scale 4A are selectively detected in accordance with the switch-over of the shutters 8A and 8B by the image sensor unit 3." (Col. 5, lines 17-20).

In the solution in Fig. 4 of Hoshiyama, the optical indicia device (the scale plate 4A) is fixed in its position, and is not movable from a first position to a second position as claimed. There is no teaching or suggestion within Hoshiyama that would motivate one of ordinary skill in the art to modify the reference to make the scale plate 4A movable. Certainly such a modification *could* be performed, and such a modification would not render the apparatus of Hoshiyama inoperable, however, ***whether a modification could be performed is not the proper standard for evaluating whether a modification is appropriate under the U.S. patent law.*** MPEP § 2143.01 (*citing In re Mills*, 916 F.2d 680 (Fed. Cir. 1990) (holding with respect to a combination of cited art that the art must suggest the desirability of the combination)). Rather, the standard for ascertaining whether a modification is appropriate is whether a ***clear and particular motivation*** may be found in the references themselves, in the nature of the problem to be solved, or in the knowledge generally available to one skilled in the art. The Office Action avers that altering the apparatus of Hoshiyama in accordance with the present invention would simplify construction and reduce cost by eliminating the half mirror and the shutter. ***This evidence, however, is not suggested by the art, but rather constitutes a post-modification rationalization, wherein the modification of Hoshiyama in the Office Action is clearly a hindsight use of the pending claims as a blueprint, which is prohibited.***

Further, the Office Action neglects that in Figs. 2, 3, 5, and 6 of Hoshiyama, the scale plate 4A is positioned in the optical path between the image sensor 3 and the article 2, however, ***in no case did the art even hint that the scale plate 4A could be selectively moved or would be desirable. Rather, in each case, the scale plate 4A is fixed with respect to the article 2.*** Therefore one of ordinary skill in the art would not have been motivated to modify the cited art in accordance with the present invention.

The Hoshiyama reference is not being read too narrowly, nor does the analysis thereof ignore the skill of those in the art as alleged in the Advisory Action.

In the above analysis, applicants contend that there is no suggestion to modify the cited reference in accordance with the claimed invention. The Advisory Action responds to the contentions above by stating that the cited art is being read too narrowly and ignores the skill of those in the art. (See Advisory Action, April 27, 2005, p. 2, ¶1). Applicants respectfully disagree.

Although a modification in accordance with the prior art may eliminate one or more components, one of ordinary skill in the art would appreciate that moving the optical indicia device in accordance with the present invention may create additional undesirable issues that may have some cost or degradation in performance associated therewith. For example, since the goal is to identify the location of defects in a workpiece, the positional relationship between the optical indicia device and the workpiece needs to be known, communicated, and well controlled. Hoshiyama addresses this issue by maintaining a ***fixed positional relationship*** therebetween. Therefore in order to maintain the positional relationship as set forth in Hoshiyama, additional elements would likely be necessary (and appreciated by one skilled in the art) in a solution where the optical indicial device is moveable between two positions. Therefore a reduction in cost or the number of components in such a modification is uncertain, at best. The cited art of record and the "Official Notice" taken in the record does not provide any disclosure or detail that would provide one of ordinary skill

guidance or motivation in making such modifications. ***Consequently, contrary to the assertion in the Advisory Action, any motivation to alter the fixed positional relationship in Hoshiyama would not be clear and particular to one of ordinary skill in the art as required.*** Consequently, no motivation for modifying the reference exists.

Therefore claims 13 and 25 are non-obvious over the cited art. Accordingly, a reversal of the rejection of claims 13 and 25 is respectfully requested.

CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejections of claims 13 and 25 be reversed.

For any extra fees or any underpayment of fees for filing of this Brief, the Commissioner is hereby authorized to charge the Deposit Account Number 50-1733, AMDP458US.

Respectfully submitted,
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CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: July 5, 2005



Christine Gillroy

VIII. Claims Appendix (37 C.F.R. § 41.37(c)(1)(viii))

1-7. (Canceled).

8. (Previously presented) An optical defect inspection system for identifying and locating defects in a workpiece, comprising:

an optical measurement device adapted to view the workpiece along an optical path; and

an optical indicia device located in the optical path, adapted to provide location information with respect to a defect in the workpiece;

wherein the optical indicia device comprises a generally planar transparent member having non-transparent optical indicia defining a plurality of transparent regions in the optical indicia device along the optical path, wherein the optical indicia device is mounted in a first plane generally perpendicular to the optical path, and wherein the transparent member is movable with respect to the workpiece between a first position in the first plane, and a second position in a second plane, and wherein the second plane is parallel with the first plane.

9. (Original) The system of claim 8, wherein the first and second planes are generally horizontal and wherein the optical path is generally vertical.

10. (Original) The system of claim 8, wherein the transparent member is generally laterally movable with respect to the optical path.

11. (Original) The system of claim 8, wherein the optical indicia device is movable between a first position wherein at least a portion of the optical indicia device is located in the optical path, and a second position wherein the optical indicia device is located outside the optical path.

12. (Canceled).

13. (Previously presented) An optical defect inspection system for identifying and locating defects in a workpiece, comprising:

an optical measurement device adapted to view the workpiece along an optical path; and

an optical indicia device located in the optical path, adapted to provide location information with respect to a defect in the workpiece;

wherein the optical indicia device comprises a generally planar transparent member having non-transparent optical indicia defining a plurality of transparent regions in the optical indicia device along the optical path, wherein the optical indicia device is mounted in a first plane generally perpendicular to the optical path, and wherein the optical indicia device is movable between a first position wherein the optical indicia device is located in the optical path, and a second position wherein the optical indicia device is located outside the optical path.

14-16 (Canceled).

17. (Original) In an optical defect inspection system having an optical measurement device adapted to view a workpiece along an optical path and an optical indicia device located in the optical path between the workpiece and the optical measurement device, a method of identifying and locating defects in the workpiece, comprising:

identifying a first defect in a first workpiece using the optical measurement device;

determining a location of the first defect using the optical indicia device;

inspecting at least a portion of a second workpiece using the optical measurement device and the optical indicia device according to the location of the first defect in the first workpiece;

determining whether a second defect exists in the inspected portion of the second workpiece using the optical measurement device; and

correlating the first and second defects according to the location of the first defect in the first workpiece, if a second defect exists in the inspected portion of the second workpiece.

18. (Original) The method of claim 17, wherein determining the location of the first defect using the optical indicia device comprises obtaining location information from the optical indicia device regarding the relative position of the optical measurement device and the first workpiece.

19. (Original) The method of claim 18, wherein the optical indicia device comprises a transparent member having non-transparent optical indicia defining a plurality of transparent regions in the transparent member, wherein at least one of the transparent regions is located along the optical path, and wherein the optical indicia device is adapted to provide the location information according to the at least one transparent region located along the optical path.

20. (Original) The method of claim 19, wherein inspecting the portion of a second workpiece using the optical measurement device and the optical indicia device according to the location of the first defect in the first workpiece comprises locating the optical measurement device with respect to the second workpiece via the optical indicia device to view the second workpiece through the at least one transparent region located along the optical path.

21. (Original) The method of claim 17, wherein correlating the first and second defect according to the location of the first defect in the first workpiece comprises determining whether the cause of the second defect is also the cause of the first defect.

22. (Original) In an optical defect inspection system having an optical measurement device adapted to view a workpiece along an optical path and an optical indicia device located in the optical path between the workpiece and the optical

measurement device, a method of identifying and locating defects in the workpiece, comprising:

identifying a blank workpiece defect in a blank workpiece using the optical measurement device;

determining a location of the blank workpiece defect using the optical indicia device;

identifying a patterned workpiece defect in a patterned workpiece using the optical measurement device;

determining a location of the patterned workpiece defect using the optical indicia device; and

correlating the locations of the blank workpiece defect and the patterned workpiece defect in order to determine a cause of the patterned workpiece defect.

23. (Canceled).

24. (Original) In an optical defect inspection system having an optical measurement device adapted to view a workpiece along an optical path and an optical indicia device located in the optical path between the workpiece and the optical measurement device and having a transparent member with non-transparent optical indicia defining a plurality of transparent regions in the optical indicia device along the optical path, a method of identifying a defect in a blank workpiece, comprising:

viewing images of two portions of the workpiece through two of the transparent regions using the optical measurement device;

comparing the images of the two portions of the workpiece; and

identifying a defect in the workpiece in one of the two portions of the workpiece if there is a difference in the images of the two portions of the workpiece.

25. (Original) An optical defect inspection system for locating defects in a workpiece, comprising:

viewing means for viewing at least a portion of a workpiece along an optical path;
and

defect location means for locating a defect in the workpiece;

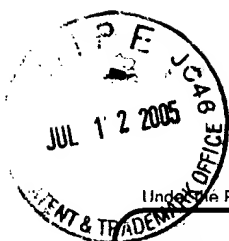
wherein the defect location means is selectively movable between a first position in the optical path between the viewing means and the workpiece, and a second position outside the optical path, and wherein the defect location means is adapted to provide location information relating to the relative position of the defect with respect to the workpiece.

IX. Evidence Appendix (37 C.F.R. § 41.37(c)(1)(ix))

No additional evidence not already part of the official record is relied upon in the arguments provided herein.

X. Related Proceedings Appendix (37 C.F.R. § 41.37(c)(1)(x))

Not applicable.



PTO/SB/17 (12-04)

Approved for use through 07/31/2006. OMB 0651-0032

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FEE TRANSMITTAL

For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 500.00

Complete if Known

Application Number	09/634,302
Filing Date	August 8, 2000
First Named Inventor	Ramkumar Subramanian et al.
Examiner Name	Richard A. Rosenberger
Art Unit	2877
Attorney Docket No.	AMDP458US

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☒ Other (please identify): Deposit Account
☒ Deposit Account Deposit Account Number: 01-0365 Deposit Account Name: Advanced Micro Devices, Inc.

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP =	x	50.00	=			
HP = highest number of total claims paid for, if greater than 20						
Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)			
- 3 or HP =	x	200.00	=			
HP = highest number of independent claims paid for, if greater than 3						

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =	/ 50 =	(round up to a whole number) x		

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other: Filing a Brief in Support of an Appeal

Fees Paid (\$)

500.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	36,981	Telephone	(216) 502-0600
Name (Print/Type)	Thomas G. Eschweiler			Date	

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